

SMG

#2

THE WATER'S MOVING FASTER! LOOKS LIKE WE'RE IN A RIVER!

I WAS HOPING FOR A PUDDLE.

SCIENCE MOM

WWW.SCIENCE.MOM

www.youtube.com/ScienceMom

SCIENCE MOM'S

Guide to WATER, Part 2

SO WHAT HAPPENS NOW? WHERE DOES ALL THE WATER GO AFTER IT RAINS?

WHO KNOWS? WE COULD END UP IN A PUDDLE, GROUND WATER, OR A RIVER!

Think of a big lake versus a dewdrop. Pretty big difference in size, right?

CRATER LAKE, OREGON

DEWDROP ON A PIECE OF GRASS

The dewdrop is SUPER small compared to the lake. But a water molecule (the smallest bit of water you can have) is MUCH smaller than a dewdrop.

A single drop of water has more than 1,000,000,000,000,000,000 water molecules! That huge number with 21 zeros is called a sextillion, and it is a TRILLION TIMES BIGGER than one billion.

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YAHOO!

THEN SET THE BOAT IN WATER AND WATCH IT GO!

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One touch of soap, and the pepper shoots to the edges of the bowl!

Method:

a) Place water in bowl and sprinkle with pepper.

b) Add a touch of soap to the surface of the water.

c) Watch the pepper scatter!

Materials:

Bowl or plate

Ground black pepper

Concentrated dish soap

Water

2. Soap Boat

GET A SQUARE OF PAPER, PREFERABLY CARDSOCK.

CUT THE PAPER LIKE THIS FOR THE BACK OF THE BOAT.

ADD A DROP OF SOAP HERE.

THEN FOLD THE FRONT LIKE THIS.

LET'S TALK ABOUT BIG NUMBERS

How long to count that high*

How many zeros

Name

Million

Billion

Trillion

Quadrillion

Quintillion

Sextillion

Septillion

Googol

6 (1,000,000)

9 (1,000,000,000)

12

15

18

31 billion years

31 trillion years

317 trillion centuries

Don't be ridiculous!

GOOGOL? ISN'T THAT THE NAME OF AN INTERNET SEARCH ENGINE?

THAT'S WHAT I SAID.

NO, YOU SAID GOOGOL.

HUH?

JUST GOOGLE GOOGOL AND YOU'LL FIGURE IT OUT!

*Assuming a rate of counting one number per second.

3. Floating Pin

Materials:

A small pin or needle

Bowl or cup

Concentrated dish soap

Water

Method:

a) Fill bowl or cup with water and carefully place pin on surface. Hint: tweezers may help. The pin must be flat with the surface of the water. It will sink if it comes in at an angle.

b) Add a touch of soap.

c) Watch the pin sink!

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A touch of soap at the edge disrupts the surface tension, and a second later the pin sinks!

IT'S LIKE MAGIC!! DO IT AGAIN!

4. Floating Paperclip

Materials:

Paper clip

Tissue paper or paper towel

Cup or bowl

Water

Method:

a) Fill the cup with water and gently place a piece of tissue paper on the surface.

b) Carefully place a dry paperclip on the tissue.

c) The tissue should sink. If it doesn't, give it a gentle push downward.

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Tip: be sure that the cup and water are not soapy.

Idea: IF IT WORKS WITH A PAPERCLIP, HOW ABOUT SOMETHING BIGGER, LIKE A FLOATING COUCH!

Reality: THE SURFACE TENSION OF WATER IS ONLY 72 DYNES PER CENTIMETER!

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COOL SCIENCE WORDS

IT'S CALLED POLARITY!

I WONDER WHAT IT IS?

THE OTHER HALF HAS A NEGATIVE CHARGE. THERE'S GOT TO BE A WORD FOR IT.

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negative sides.

form between the positive and negative (- -). Hydrogen bonds (∩)

Positive loves negative. Each water molecule is part positive (+) and part negative (-).

Because opposites attract!

But WHY do water molecules want to be by each other?

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Wow!

A lot! The molecules on the surface pull in, creating a dome of water on the coin.

Answer:

Question:

How many drops of water can you fit on a coin before the water spills off the side?

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BALANCED FORCES.

Water in the middle.

UNBALANCED FORCES.

Water on the surface.

or make a dome of water on a coin.

which helps raindrops stay together and allows us to fill cups above the brim,

the surface bond more tightly to their neighbors. This creates surface tension, Water molecules like each other more than they like air, so the molecules on

HOW DOES IT WORK?

Surface Tension.

B	A	A	X
B	C	C	D
F	E	E	D
E	G	G	X